

SEQUENCE LISTING

<110> Delcayre, Alain

<120> Compounds for Treatment of Infectious and Immune System Disorders
and Methods for Their Use

<130> 11000.1042c3

<150> 10/100,679

<151> 2002-03-14

<150> 09/450,072

<151> 1999-11-29

<150> 09/351,348

<151> 1999-07-12

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 tcacgcggcg tcgtggctcc gcaacccgcc ggcgatgtcg cgcgcgcgcg tgcggccggc 180
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<400> 21
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<223> Made in a lab

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<223> Made in a lab

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gcgacgatca	acgcgatgga	agacgaaggc	atggtggcca	acgctgcccg	catcggcgag	240
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cgcggcctcg	gcgtcttctg	ggcgggatct	gatccagaac	gggccgggtct	gcgggttgag	360
gtcctcggtg	cccagtgcgc	tcgacgcgac	gtcgtcggcg	ctggtgatgc	ggccgccgta	420
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ctggtcgcca	gcccgcgcag	ggcagccagt	tccgctccgg	cgctcgatcg	gttgggtccg	540
tccggccagc	acaccagcat	ccacccgagg	tcgagcaacg	ggtccccgac	ggtgcacatc	600
tcccagtcga	tgaacgcgcg	gagctcgggg	acgtcgcggc	gcagcagcac	gttggtcaga	660
tggcagtcgc	cgtgtcatgat	cccgggttcg	gcgtcgtcgg	gcctgcgcga	gtccagccag	720
tcggcgagca	catgcaccga	cgggaacgac	tcgggcgcgg	gatctgatca	gctcggggag	780
ccgggtgccc	agcaacgccca	gcgtgggaag	caccgagacc	ggcgcgatgt	gcccgcgcag	840
cagcgcgccag	ccgtgcaccc	cgcgggaccg	ggccccgcgg	accgcgtcgg	agtcgacccc	900
ggccgccacc	gccgcgcgcg	tggtcagcat	cagccacggg	atggatctga	tcggcaggca	960
tcacgaacag	taagcgggtg	tccggttgaa	tccaatgtgc	tgtcagcagg	catccgatgc	1020
cgaacaccga	ccacgcgagc	agtcgcaatc	tgtctcgcga	ccctggcgctc	acgcggcgctc	1080
gtggctccgc	aaccgcgcgg	cgatgtcgcg	cgcgcgcgctg	cggccgggctc	tccatggccg	1140
gttcgttcag	tcgctcgtcc	ggtggctggt	ctgcgaacgg	gcccgcgcgc	ccgtcgtccg	1200
tccgatacgg	gatctatcac	gcaggtaggc	cgtccagccg	tactcttcgc	cccagaacag	1260
cgggtgccgtc	gccgcgcgaga	ccagcgggtc	tgccgccaga	tacaccagag	cgggtggccgg	1320
catgtccaga	tcgtggccag	cgcgcgcggc	acggtggaga	tcggatctat	cgcgcgggctg	1380
tgcgggaagg	acgaggccgt	agcggcggtt	cactacgtcg	ccccggttgg	cgagaagcag	1440
gactacatcg	accgagcctt	gcgcaacatc	gggcccgtatc	tgccagctga	ggttcccgcgt	1500
ctcgtcggat	ctatcgccgc	caccggcccc	gtgcccggga	ccgcgtggat	cgttcgtcag	1560
tacccaagc	tcttgagagc	taaggccaat	tgggaagata	cttggaacct	cccatcaata	1620
gaggaagc	atcgccctag	gggatccgta	gcggggcccg	tgtttcgagt	gaacttgggc	1680
agggcaatcc	catcgcgcg	agccccgcga	gcggaaatcc	acggatccca	tcaccatcac	1740

catcactga

1749

<210> 59
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 59
cgatctactc gaccttcgcc gac

23

<210> 60
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 60
tcagtggtt tccgctgcgc gggc

24

<210> 61
<211> 46
<212> PRT
<213> Mycobacterium vaccae

<400> 61
Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15
Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
20 25 30
Ser Arg Leu Phe Asp Asn Ala Met Gln Leu Trp Leu Arg Asp
35 40 45

<210> 62
<211> 46
<212> PRT
<213> Mycobacterium vaccae

<400> 62
Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15
Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
20 25 30
Ser Arg Leu Phe Asp Asn Ala Met Gln Leu Trp Leu Arg Ile
35 40 45

<210> 63
<211> 46
<212> PRT
<213> Mycobacterium vaccae

<400> 63
Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu

1	5	10	15												
Cys	Leu	Pro	Trp	Leu	Gln	Glu	Gly	Ser	Ala	Phe	Pro	Thr	Ile	Pro	Leu
		20						25					30		
Ser	Arg	Leu	Phe	Asp	Asn	Ala	Met	Gln	Leu	Trp	Leu	Pro	Gly		
	35						40					45			

<210> 64
 <211> 13
 <212> PRT
 <213> Mycobacterium vaccae

<400> 64												
Ile	Ala	Ala	Thr	Gly	Pro	Val	Pro	Gly	Thr	Ala	Trp	Ile
1			5					10				

<210> 65
 <211> 32
 <212> PRT
 <213> Mycobacterium vaccae

<400> 65															
Val	Arg	Gln	Tyr	Pro	Lys	Leu	Leu	Arg	Ala	Lys	Ala	Asn	Trp	Glu	Asp
1			5					10					15		
Thr	Trp	Thr	Phe	Pro	Ser	Ile	Glu	Glu	Lys	His	Arg	Pro	Arg	Gly	Ser
		20					25						30		

<210> 66
 <211> 25
 <212> PRT
 <213> Mycobacterium vaccae

<400> 66															
Val	Ala	Gly	Pro	Val	Phe	Arg	Val	Asn	Leu	Gly	Arg	Ala	Ile	Pro	Ser
1			5					10					15		
Arg	Ala	Ala	Arg	Ala	Ala	Glu	Ile	His							
		20					25								

<210> 67
 <211> 38
 <212> PRT
 <213> Mycobacterium vaccae

<400> 67															
Ile	Thr	Gln	Val	Gly	Arg	Pro	Ala	Val	Leu	Phe	Ala	Pro	Glu	Gln	Arg
1			5					10					15		
Cys	Arg	Arg	Arg	Ala	Asp	Gln	Arg	Ser	Cys	Arg	Gln	Ile	His	Pro	Gly
		20					25					30			
Gly	Gly	Arg	His	Val	Gln										
	35														

<210> 68
 <211> 11
 <212> PRT
 <213> Mycobacterium vaccae

<400> 68										
Ile	Val	Ala	Ser	Ala	Arg	Gly	Thr	Val	Glu	Ile

1 5 10

<210> 69
 <211> 70
 <212> PRT
 <213> Mycobacterium vaccae

<400> 69
 Ile Ala Ala Thr Gly Pro Val Pro Gly Thr Ala Trp Ile Val Arg Gln
 1 5 10 15
 Tyr Pro Lys Leu Leu Arg Ala Lys Ala Asn Trp Glu Asp Thr Trp Thr
 20 25 30
 Phe Pro Ser Ile Glu Glu Lys His Arg Pro Arg Gly Ser Val Ala Gly
 35 40 45
 Pro Val Phe Arg Val Asn Leu Gly Arg Ala Ile Pro Ser Arg Ala Ala
 50 55 60
 Arg Ala Ala Glu Ile His
 65 70

<210> 70
 <211> 75
 <212> PRT
 <213> Mycobacterium vaccae

<400> 70
 Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1 5 10 15
 Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
 20 25 30
 Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
 35 40 45
 Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
 50 55 60
 Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala
 65 70 75

<210> 71
 <211> 97
 <212> PRT
 <213> Mycobacterium vaccae

<400> 71
 Ile Ser Ser Ala Leu Val Ala Ser Pro Pro Arg Ala Ala Ser Ser Ala
 1 5 10 15
 Pro Ala Ser Ile Gly Leu Gly Pro Ser Gly Gln His Thr Ser Ile His
 20 25 30
 Pro Arg Ser Ser Asn Gly Ser Pro Thr Val His Ile Ser Gln Ser Met
 35 40 45
 Asn Ala Ala Ser Ser Gly Thr Ser Arg Arg Ser Ser Thr Leu Phe Arg
 50 55 60
 Trp Gln Ser Pro Cys Met Ile Pro Gly Ser Ala Ser Ser Gly Leu Arg
 65 70 75 80
 Glu Ser Ser Gln Ser Ala Ser Thr Cys Thr Asp Gly Asn Asp Ser Gly
 85 90 95
 Ala

<210> 72
 <211> 49
 <212> PRT
 <213> Mycobacterium vaccae

<400> 72
 Ile Thr Gln Val Gly Arg Pro Ala Val Leu Phe Ala Pro Glu Gln Arg
 1 5 10 15
 Cys Arg Arg Arg Ala Asp Gln Arg Ser Cys Arg Gln Ile His Pro Gly
 20 25 30
 Gly Gly Arg His Val Gln Ile Val Ala Ser Ala Arg Gly Thr Val Glu
 35 40 45
 Ile

<210> 73
 <211> 46
 <212> PRT
 <213> Mycobacterium vaccae

<400> 73
 Ile Ala Arg Leu Cys Gly Lys Asp Glu Ala Val Ala Ala Leu His Tyr
 1 5 10 15
 Val Ala Pro Val Gly Glu Lys Gln Asp Tyr Ile Asp Arg Ala Leu Arg
 20 25 30
 Asn Ile Gly Pro Tyr Leu Pro Ala Glu Val Pro Ala Leu Val
 35 40 45

<210> 74
 <211> 87
 <212> PRT
 <213> Mycobacterium vaccae

<400> 74
 Asp Arg Gln Ala Ser Arg Thr Val Ser Gly Val Pro Val Glu Ser Asn
 1 5 10 15
 Val Leu Ser Ala Gly Ile Arg Cys Arg Thr Pro Thr Thr Arg Ala Val
 20 25 30
 Ala Ile Cys Leu Ala Thr Leu Ala Ser Arg Gly Val Val Ala Pro Gln
 35 40 45
 Pro Ala Gly Asp Val Ala Arg Ala Ala Ala Ala Gly Ser Pro Trp Pro
 50 55 60
 Val Arg Ser Val Ala Arg Pro Val Ala Val Leu Arg Thr Gly Pro Pro
 65 70 75 80
 Pro Arg Arg Pro Ser Asp Thr
 85

<210> 75
 <211> 93
 <212> PRT
 <213> Mycobacterium vaccae

<400> 75
 Asp Leu Val Ala Arg Pro Arg Asp Leu Arg Pro Val Arg Pro Ala Leu
 1 5 10 15
 His His Arg Val Leu Pro Gly Ala Val Arg Gln Val Val Ala His Asp
 20 25 30

Arg Glu Thr Val Ala Ala Gly Gln Val Pro Ala Arg His Arg Arg Arg
35 40 45
Arg Pro Gly Asp Pro Gln Arg Ala Asp Val Arg Arg Thr Gly Ser Val
50 55 60
Gly Ala Ala Arg Ala Glu Val Gly His Arg Arg Gly Ala Val Ala Pro
65 70 75 80
Ala Arg Gln Gly Arg Cys Glu Ser Arg Glu Asp Arg Asp
85 90

<210> 76
<211> 44
<212> PRT
<213> Mycobacterium vaccae

<400> 76
Asp Pro Glu Arg Ala Gly Leu Arg Val Glu Val Leu Gly Ala Gln Cys
1 5 10 15
Arg Arg Arg Asp Val Val Gly Ala Gly Asp Ala Ala Ala Val Gly Val
20 25 30
Leu Gly Pro Gln Arg Gln His Arg Ala Arg Ala Asp
35 40

<210> 77
<211> 59
<212> PRT
<213> Mycobacterium vaccae

<400> 77
Asp Gln Leu Gly Glu Pro Gly Ala Gln Gln Arg Gln Arg Gly Lys His
1 5 10 15
Arg Asp Arg Arg Asp Val Pro Ala Gln Gln Arg Pro Ala Val His Pro
20 25 30
Ala Gly Pro Gly Pro Ala Asp Arg Val Gly Val Asp Pro Gly Arg His
35 40 45
Arg Arg Ala Arg Gly Gln His Gln Pro Arg Asp
50 55

<210> 78
<211> 39
<212> PRT
<213> Artificial Sequence

<220>
<223> Made in a lab

<400> 78
Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1 5 10 15
Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Gly
20 25 30
Ser His His His His His His
35

<210> 79
<211> 582
<212> PRT
<213> Artificial Sequence

<220>

<223> Made in a lab

<400> 79

Met	Ala	Thr	Gly	Ser	Arg	Thr	Ser	Leu	Leu	Leu	Ala	Phe	Gly	Leu	Leu	
1				5				10						15		
Cys	Leu	Pro	Trp	Leu	Gln	Glu	Gly	Ser	Ala	Phe	Pro	Thr	Ile	Pro	Gly	
			20					25					30			
Ser	Ile	Tyr	Ser	Thr	Phe	Ala	Asp	Arg	Ala	Tyr	Pro	Gly	Gly	Leu	Thr	
	35						40					45				
Tyr	Ser	Gly	His	Pro	Leu	Ala	Thr	Ala	Cys	Ala	Val	Ala	Thr	Ile	Asn	
	50					55					60					
Ala	Met	Glu	Asp	Glu	Gly	Met	Val	Ala	Asn	Ala	Ala	Arg	Ile	Gly	Glu	
65					70				75						80	
Gln	Val	Leu	Gly	Pro	Gly	Leu	Arg	Asp	Leu	Ala	Ala	Arg	His	Arg	Ser	
				85					90					95		
Val	Gly	Glu	Val	Arg	Gly	Leu	Gly	Val	Phe	Trp	Ala	Gly	Ser	Asp	Pro	
			100					105					110			
Glu	Arg	Ala	Gly	Leu	Arg	Val	Glu	Val	Leu	Gly	Ala	Gln	Cys	Arg	Arg	
	115						120					125				
Arg	Asp	Val	Val	Gly	Ala	Gly	Asp	Ala	Ala	Ala	Val	Gly	Val	Leu	Gly	
	130					135					140					
Pro	Gln	Arg	Gln	His	Arg	Ala	Arg	Ala	Asp	Gly	Ser	Asp	Arg	Gln	Ala	
145				150					155						160	
Ser	Arg	Thr	Val	Ser	Gly	Val	Pro	Val	Glu	Ser	Asn	Val	Leu	Ser	Ala	
				165					170					175		
Gly	Ile	Arg	Cys	Arg	Thr	Pro	Thr	Thr	Arg	Ala	Val	Ala	Ile	Cys	Leu	
	180							185					190			
Ala	Thr	Leu	Ala	Ser	Arg	Gly	Val	Val	Ala	Pro	Gln	Pro	Ala	Gly	Asp	
	195						200					205				
Val	Ala	Arg	Ala	Ala	Ala	Ala	Gly	Ser	Pro	Trp	Pro	Val	Arg	Ser	Val	
	210					215					220					
Ala	Arg	Pro	Val	Ala	Val	Leu	Arg	Thr	Gly	Pro	Pro	Pro	Arg	Arg	Pro	
225				230						235					240	
Ser	Asp	Thr	Gly	Ser	Asp	Gln	Leu	Gly	Glu	Pro	Gly	Ala	Gln	Gln	Arg	
				245					250					255		
Gln	Arg	Gly	Lys	His	Arg	Asp	Arg	Arg	Asp	Val	Pro	Ala	Gln	Gln	Arg	
	260						265						270			
Pro	Ala	Val	His	Pro	Ala	Gly	Pro	Gly	Pro	Ala	Asp	Arg	Val	Gly	Val	
	275						280					285				
Asp	Pro	Gly	Arg	His	Arg	Arg	Ala	Arg	Gly	Gln	His	Gln	Pro	Arg	Asp	
	290					295					300					
Gly	Ser	Ile	Ser	Ser	Ala	Leu	Val	Ala	Ser	Pro	Pro	Arg	Ala	Ala	Ser	
305					310					315					320	
Ser	Ala	Pro	Ala	Ser	Ile	Gly	Leu	Gly	Pro	Ser	Gly	Gln	His	Thr	Ser	
				325					330					335		
Ile	His	Pro	Arg	Ser	Ser	Asn	Gly	Ser	Pro	Thr	Val	His	Ile	Ser	Gln	
			340					345					350			
Ser	Met	Asn	Ala	Ala	Ser	Ser	Gly	Thr	Ser	Arg	Arg	Ser	Ser	Thr	Leu	
	355						360					365				
Phe	Arg	Trp	Gln	Ser	Pro	Cys	Met	Ile	Pro	Gly	Ser	Ala	Ser	Ser	Gly	
	370					375					380					
Leu	Arg	Glu	Ser	Ser	Gln	Ser	Ala	Ser	Thr	Cys	Thr	Asp	Gly	Asn	Asp	
385					390					395					400	
Ser	Gly	Ala	Gly	Ser	Ile	Thr	Gln	Val	Gly	Arg	Pro	Ala	Val	Leu	Phe	
				405					410					415		

Ala Pro Glu Gln Arg Cys Arg Arg Arg Ala Asp Gln Arg Ser Cys Arg
 420 425 430
 Gln Ile His Pro Gly Gly Gly Arg His Val Gln Ile Val Ala Ser Ala
 435 440 445
 Arg Gly Thr Val Glu Ile Gly Ser Ile Ala Arg Leu Cys Gly Lys Asp
 450 455 460
 Glu Ala Val Ala Ala Leu His Tyr Val Ala Pro Val Gly Glu Lys Gln
 465 470 475 480
 Asp Tyr Ile Asp Arg Ala Leu Arg Asn Ile Gly Pro Tyr Leu Pro Ala
 485 490 495
 Glu Val Pro Ala Leu Val Gly Ser Ile Ala Ala Thr Gly Pro Val Pro
 500 505 510
 Gly Thr Ala Trp Ile Val Arg Gln Tyr Pro Lys Leu Leu Arg Ala Lys
 515 520 525
 Ala Asn Trp Glu Asp Thr Trp Thr Phe Pro Ser Ile Glu Glu Lys His
 530 535 540
 Arg Pro Arg Gly Ser Val Ala Gly Pro Val Phe Arg Val Asn Leu Gly
 545 550 555 560
 Arg Ala Ile Pro Ser Arg Ala Ala Arg Ala Ala Glu Ile His Gly Ser
 565 570 575
 His His His His His His
 580

<210> 80
 <211> 582
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 80
 Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
 1 5 10 15
 Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Gly
 20 25 30
 Ser Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr
 35 40 45
 Tyr Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn
 50 55 60
 Ala Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu
 65 70 75 80
 Gln Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser
 85 90 95
 Val Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Ile Ser
 100 105 110
 Ser Ala Leu Val Ala Ser Pro Pro Arg Ala Ala Ser Ser Ala Pro Ala
 115 120 125
 Ser Ile Gly Leu Gly Pro Ser Gly Gln His Thr Ser Ile His Pro Arg
 130 135 140
 Ser Ser Asn Gly Ser Pro Thr Val His Ile Ser Gln Ser Met Asn Ala
 145 150 155 160
 Ala Ser Ser Gly Thr Ser Arg Arg Ser Ser Thr Leu Phe Arg Trp Gln
 165 170 175
 Ser Pro Cys Met Ile Pro Gly Ser Ala Ser Ser Gly Leu Arg Glu Ser
 180 185 190
 Ser Gln Ser Ala Ser Thr Cys Thr Asp Gly Asn Asp Ser Gly Ala Gly

195	200	205
Ser Asp Arg Gln Ala Ser	Arg Thr Val Ser Gly Val	Pro Val Glu Ser
210	215	220
Asn Val Leu Ser Ala Gly	Ile Arg Cys Arg Thr	Pro Thr Thr Arg Ala
225	230	235
Val Ala Ile Cys Leu Ala	Thr Leu Ala Ser Arg Gly	Val Val Ala Pro
245	250	255
Gln Pro Ala Gly Asp Val	Ala Arg Ala Ala Gly	Ser Pro Trp
260	265	270
Pro Val Arg Ser Val Ala	Arg Pro Val Ala Val Leu	Arg Thr Gly Pro
275	280	285
Pro Pro Arg Arg Pro Ser	Asp Thr Gly Ser Asp Gln	Leu Gly Glu Pro
290	295	300
Gly Ala Gln Gln Arg Gln	Arg Gly Lys His Arg Asp	Arg Arg Asp Val
305	310	315
Pro Ala Gln Gln Arg Pro	Ala Val His Pro Ala Gly	Pro Gly Pro Ala
325	330	335
Asp Arg Val Gly Val Asp	Pro Gly Arg His Arg Arg	Ala Arg Gly Gln
340	345	350
His Gln Pro Arg Asp Gly	Ser Ile Thr Gln Val Gly	Arg Pro Ala Val
355	360	365
Leu Phe Ala Pro Glu Gln	Arg Cys Arg Arg Arg Ala	Asp Gln Arg Ser
370	375	380
Cys Arg Gln Ile His Pro	Gly Gly Gly Arg His Val	Gln Ile Val Ala
385	390	395
Ser Ala Arg Gly Thr Val	Glu Ile Gly Ser Ile Ala	Arg Leu Cys Gly
405	410	415
Lys Asp Glu Ala Val Ala	Ala Leu His Tyr Val Ala	Pro Val Gly Glu
420	425	430
Lys Gln Asp Tyr Ile Asp	Arg Ala Leu Arg Asn Ile	Gly Pro Tyr Leu
435	440	445
Pro Ala Glu Val Pro Ala	Leu Val Gly Ser Asp Pro	Glu Arg Ala Gly
450	455	460
Leu Arg Val Glu Val Leu	Gly Ala Gln Cys Arg Arg	Arg Asp Val Val
465	470	475
Gly Ala Gly Asp Ala Ala	Ala Val Gly Val Leu Gly	Pro Gln Arg Gln
485	490	495
His Arg Ala Arg Ala Asp	Gly Ser Ile Ala Ala Thr	Gly Pro Val Pro
500	505	510
Gly Thr Ala Trp Ile Val	Arg Gln Tyr Pro Lys Leu	Leu Arg Ala Lys
515	520	525
Ala Asn Trp Glu Asp Thr	Trp Thr Phe Pro Ser Ile	Glu Glu Lys His
530	535	540
Arg Pro Arg Gly Ser Val	Ala Gly Pro Val Phe Arg	Val Asn Leu Gly
545	550	555
Arg Ala Ile Pro Ser Arg	Ala Ala Arg Ala Ala Glu	Ile His Gly Ser
565	570	575
His His His His His His		
580		

<210> 81
 <211> 582
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 81

Met	Ala	Thr	Gly	Ser	Arg	Thr	Ser	Leu	Leu	Leu	Ala	Phe	Gly	Leu	Leu
1				5				10						15	
Cys	Leu	Pro	Trp	Leu	Gln	Glu	Gly	Ser	Ala	Phe	Pro	Thr	Ile	Pro	Gly
			20					25					30		
Ser	Ile	Tyr	Ser	Thr	Phe	Ala	Asp	Arg	Ala	Tyr	Pro	Gly	Gly	Leu	Thr
		35					40					45			
Tyr	Ser	Gly	His	Pro	Leu	Ala	Thr	Ala	Cys	Ala	Val	Ala	Thr	Ile	Asn
	50					55					60				
Ala	Met	Glu	Asp	Glu	Gly	Met	Val	Ala	Asn	Ala	Ala	Arg	Ile	Gly	Glu
65					70					75					80
Gln	Val	Leu	Gly	Pro	Gly	Leu	Arg	Asp	Leu	Ala	Ala	Arg	His	Arg	Ser
				85					90					95	
Val	Gly	Glu	Val	Arg	Gly	Leu	Gly	Val	Phe	Trp	Ala	Gly	Ser	Asp	Pro
			100					105					110		
Glu	Arg	Ala	Gly	Leu	Arg	Val	Glu	Val	Leu	Gly	Ala	Gln	Cys	Arg	Arg
		115					120					125			
Arg	Asp	Val	Val	Gly	Ala	Gly	Asp	Ala	Ala	Ala	Val	Gly	Val	Leu	Gly
	130					135					140				
Pro	Gln	Arg	Gln	His	Arg	Ala	Arg	Ala	Asp	Gly	Ser	Ile	Ser	Ser	Ala
145					150					155					160
Leu	Val	Ala	Ser	Pro	Pro	Arg	Ala	Ala	Ser	Ser	Ala	Pro	Ala	Ser	Ile
				165					170					175	
Gly	Leu	Gly	Pro	Ser	Gly	Gln	His	Thr	Ser	Ile	His	Pro	Arg	Ser	Ser
			180					185					190		
Asn	Gly	Ser	Pro	Thr	Val	His	Ile	Ser	Gln	Ser	Met	Asn	Ala	Ala	Ser
		195					200					205			
Ser	Gly	Thr	Ser	Arg	Arg	Ser	Ser	Thr	Leu	Phe	Arg	Trp	Gln	Ser	Pro
	210					215					220				
Cys	Met	Ile	Pro	Gly	Ser	Ala	Ser	Ser	Gly	Leu	Arg	Glu	Ser	Ser	Gln
225					230					235					240
Ser	Ala	Ser	Thr	Cys	Thr	Asp	Gly	Asn	Asp	Ser	Gly	Ala	Gly	Ser	Asp
				245					250					255	
Gln	Leu	Gly	Glu	Pro	Gly	Ala	Gln	Gln	Arg	Gln	Arg	Gly	Lys	His	Arg
			260					265					270		
Asp	Arg	Arg	Asp	Val	Pro	Ala	Gln	Gln	Arg	Pro	Ala	Val	His	Pro	Ala
		275					280					285			
Gly	Pro	Gly	Pro	Ala	Asp	Arg	Val	Gly	Val	Asp	Pro	Gly	Arg	His	Arg
	290					295					300				
Arg	Ala	Arg	Gly	Gln	His	Gln	Pro	Arg	Asp	Gly	Ser	Asp	Arg	Gln	Ala
305					310					315					320
Ser	Arg	Thr	Val	Ser	Gly	Val	Pro	Val	Glu	Ser	Asn	Val	Leu	Ser	Ala
				325					330					335	
Gly	Ile	Arg	Cys	Arg	Thr	Pro	Thr	Thr	Arg	Ala	Val	Ala	Ile	Cys	Leu
			340					345					350		
Ala	Thr	Leu	Ala	Ser	Arg	Gly	Val	Val	Ala	Pro	Gln	Pro	Ala	Gly	Asp
		355					360					365			
Val	Ala	Arg	Ala	Ala	Ala	Ala	Gly	Ser	Pro	Trp	Pro	Val	Arg	Ser	Val
	370					375					380				
Ala	Arg	Pro	Val	Ala	Val	Leu	Arg	Thr	Gly	Pro	Pro	Pro	Arg	Arg	Pro
385					390					395					400
Ser	Asp	Thr	Gly	Ser	Ile	Thr	Gln	Val	Gly	Arg	Pro	Ala	Val	Leu	Phe
				405					410					415	
Ala	Pro	Glu	Gln	Arg	Cys	Arg	Arg	Arg	Ala	Asp	Gln	Arg	Ser	Cys	Arg
			420					425				430			
Gln	Ile	His	Pro	Gly	Gly	Gly	Arg	His	Val	Gln	Ile	Val	Ala	Ser	Ala

435 440 445
 Arg Gly Thr Val Glu Ile Gly Ser Ile Ala Arg Leu Cys Gly Lys Asp
 450 455 460
 Glu Ala Val Ala Ala Leu His Tyr Val Ala Pro Val Gly Glu Lys Gln
 465 470 475 480
 Asp Tyr Ile Asp Arg Ala Leu Arg Asn Ile Gly Pro Tyr Leu Pro Ala
 485 490 495
 Glu Val Pro Ala Leu Val Gly Ser Ile Ala Ala Thr Gly Pro Val Pro
 500 505 510
 Gly Thr Ala Trp Ile Val Arg Gln Tyr Pro Lys Leu Leu Arg Ala Lys
 515 520 525
 Ala Asn Trp Glu Asp Thr Trp Thr Phe Pro Ser Ile Glu Glu Lys His
 530 535 540
 Arg Pro Arg Gly Ser Val Ala Gly Pro Val Phe Arg Val Asn Leu Gly
 545 550 555 560
 Arg Ala Ile Pro Ser Arg Ala Ala Arg Ala Ala Glu Ile His Gly Ser
 565 570 575
 His His His His His His
 580

<210> 82
 <211> 225
 <212> DNA
 <213> Mycobacterium vaccae

<400> 82
 atctactcga ccttcgccga ccgggcgtac ccgggtggcc tgacgtactc cggccatccg 60
 ctggcgaccg cctgcgcggt cgcgacgata aacgcgatgg aagacgaagg catggtggcc 120
 aacgctgccc gcatcggcga gcaggtgctc ggaccgggta tgcgcgatct cgccgcccgg 180
 caccgttcgg tcggcgaagt ccgcggcctc ggcgtcttct gggcg 225

<210> 83
 <211> 363
 <212> DNA
 <213> Mycobacterium vaccae

<400> 83
 atctactcga ccttcgccga ccgggcgtac ccgggtggcc tgacgtactc cggccatccg 60
 ctggcgaccg cctgcgcggt cgcgacgata aacgcgatgg aagacgaagg catggtggcc 120
 aacgctgccc gcatcggcga gcaggtgctc ggaccgggta tgcgcgatct cgccgcccgg 180
 caccgttcgg tcggcgaagt ccgcggcctc ggcgtcttct gggcgggata tgatccagaa 240
 cgggcgggta tgcgggttga ggtcctcggt gccagtgcc gtcgacgcga cgtcgtcggc 300
 gctggtgatg cggccgcccgt aggcgtcctc ggtccacaac gtcagcaccg tgcccggggc 360
 gat 363

<210> 84
 <211> 660
 <212> DNA
 <213> Mycobacterium vaccae

<400> 84
 atctactcga ccttcgccga ccgggcgtac ccgggtggcc tgacgtactc cggccatccg 60
 ctggcgaccg cctgcgcggt cgcgacgata aacgcgatgg aagacgaagg catggtggcc 120
 aacgctgccc gcatcggcga gcaggtgctc ggaccgggta tgcgcgatct cgccgcccgg 180
 caccgttcgg tcggcgaagt ccgcggcctc ggcgtcttct gggcgggata tgatccagaa 240
 cgggcgggta tgcgggttga ggtcctcggt gccagtgcc gtcgacgcga cgtcgtcggc 300
 gctggtgatg cggccgcccgt aggcgtcctc ggtccacaac gtcagcaccg tgcccggggc 360

gatggatcta	tcagttcggc	cctggtcgcc	agcccgccga	gggcagccag	ttccgctccg	420
gcgtcgatcg	ggttgggtcc	gtccggccag	cacaccagca	tccacccgag	gtcgagcaac	480
gggtccccga	cggtgcacat	ctcccagtcg	atgaacgccg	cgagctcggg	gacgtcgcgg	540
cgcagcagca	cgttgttcag	atggcagtcg	ccgtgcatga	tcccgggttc	ggcgtcgtcg	600
ggcctgcgcg	agtccagcca	gtcggcgagc	acatgcaccg	acgggaacga	ctcgggcgcg	660

<210> 85

<211> 843

<212> DNA

<213> *Mycobacterium vaccae*

<400> 85

atctactcga	ccttcgccga	ccgggcgtac	ccgggtggcc	tgacgtactc	cggccatccg	60
ctggcgaccg	cctgcgcggg	cgcgacgac	aacgcgatgg	aagacgaagg	catgggtggc	120
aacgctgccc	gcacgcggca	gcaggtgctc	ggaccgggtc	tgccgcgatc	cgcgcgcccg	180
caccgttcgg	tcggcgaagt	ccgcggcctc	ggcgtcttct	gggcgggata	tgatccagaa	240
cgggcccggc	tgccgggttg	ggtcctcggt	gcccagtgcc	gtcgacgcga	cgctcgtcgg	300
gctggtgatg	cggccgcggg	aggcgtcctc	ggtccacaac	gtcagcaccg	tgcccggggc	360
gatggatcta	tcagttcggc	cctggtcgcc	agcccgccga	gggcagccag	ttccgctccg	420
gcgtcgatcg	ggttgggtcc	gtccggccag	cacaccagca	tccacccgag	gtcgagcaac	480
gggtccccga	cggtgcacat	ctcccagtcg	atgaacgccg	cgagctcggg	gacgtcgcgg	540
cgcagcagca	cgttgttcag	atggcagtcg	ccgtgcatga	tcccgggttc	ggcgtcgtcg	600
ggcctgcgcg	agtccagcca	gtcggcgagc	acatgcaccg	acgggaacga	ctcgggcgcg	660
ggatctgatc	agctcgggga	gccgggtgcc	cagcaacgcc	agcgtgggaa	gcaccgagac	720
cggcgcgatg	tgcccgcgca	gcagcgccca	gccgtgcacc	ccgcgggacc	gggccccgcg	780
gaccgcgtcg	gagtcgaccc	cggccgccac	cgcgcgcgcg	gtggtcagca	tcagccacgg	840
gat						843

<210> 86

<211> 1116

<212> DNA

<213> *Mycobacterium vaccae*

<400> 86

atctactcga	ccttcgccga	ccgggcgtac	ccgggtggcc	tgacgtactc	cggccatccg	60
ctggcgaccg	cctgcgcggg	cgcgacgac	aacgcgatgg	aagacgaagg	catgggtggc	120
aacgctgccc	gcacgcggca	gcaggtgctc	ggaccgggtc	tgccgcgatc	cgcgcgcccg	180
caccgttcgg	tcggcgaagt	ccgcggcctc	ggcgtcttct	gggcgggata	tgatccagaa	240
cgggcccggc	tgccgggttg	ggtcctcggt	gcccagtgcc	gtcgacgcga	cgctcgtcgg	300
gctggtgatg	cggccgcggg	aggcgtcctc	ggtccacaac	gtcagcaccg	tgcccggggc	360
gatggatcta	tcagttcggc	cctggtcgcc	agcccgccga	gggcagccag	ttccgctccg	420
gcgtcgatcg	ggttgggtcc	gtccggccag	cacaccagca	tccacccgag	gtcgagcaac	480
gggtccccga	cggtgcacat	ctcccagtcg	atgaacgccg	cgagctcggg	gacgtcgcgg	540
cgcagcagca	cgttgttcag	atggcagtcg	ccgtgcatga	tcccgggttc	ggcgtcgtcg	600
ggcctgcgcg	agtccagcca	gtcggcgagc	acatgcaccg	acgggaacga	ctcgggcgcg	660
ggatctgatc	agctcgggga	gccgggtgcc	cagcaacgcc	agcgtgggaa	gcaccgagac	720
cggcgcgatg	tgcccgcgca	gcagcgccca	gccgtgcacc	ccgcgggacc	gggccccgcg	780
gaccgcgtcg	gagtcgaccc	cggccgccac	cgcgcgcgcg	gtggtcagca	tcagccacgg	840
gatggatctg	atcggcaggc	atcacgaaca	gtaagcgggtg	ttccggttga	atccaatgtg	900
ctgtcagcag	gcacccgatg	ccgaacaccg	accacgcgag	cagtcgcaat	ctgtctcgcg	960
accctggcgt	cacgcggcgt	cgtgggtccg	caacccgccg	gcgatgtcgc	gcgcgcgcgt	1020
gcggccgggt	ctccatggcc	ggttcgttca	gtcgtcgtcg	cgggtggctgt	tctgcgaacg	1080
ggcccgcgcg	cccgtcgtcc	gtccgatacg	ggatct			1116

<210> 87

<211> 1263

<212> DNA

<213> Mycobacterium vaccae

<400> 87

atctactcga	ccttcgccga	ccgggcgtag	ccgggtggcc	tgacgtactc	cggccatccg	60
ctggcgaccg	cctgcgcggg	cgcgacgata	aacgcgatgg	aagacgaagg	catggtggcc	120
aacgctgccc	gcacgcggca	gcaggtgctc	ggaccgggtc	tgcgcgatct	cgccgcccgg	180
caccgttcgg	tcggcgaaat	ccgcggcctc	ggcgctcttc	gggcgggata	tgatccagaa	240
cgggcccggc	tgcgggttga	ggctctcggt	gcccagtgcc	gtcgacgcga	cgctgctcgg	300
gctggtgatg	cggccgcggg	aggcgctctc	ggccacaaac	gtcagcaccg	tgcccggggc	360
gatggatctt	cggccctggg	cgccagcccc	ccgagggcag	ccagttccgc	tccggcgctc	420
atcgggttgg	gtccgctcgg	ccagcacacc	agcatccacc	cgaggtcgag	caacgggtcc	480
ccgacggtgc	acatctccca	gtcgatgaac	gcccgcagct	cggggacgtc	gcggcgagc	540
agcacgttgt	tcagatggca	gtcgccgtgc	atgatcccg	gttcggcgct	gtcgggcctg	600
cgcgagtcca	gccagtcggc	gagcacatgc	accgacggga	acgactcggg	cgcgggatct	660
gatcagctcg	gggagccggg	tgcccagcaa	cgccagcggt	ggaagcaccg	agaccggcgc	720
gatgtgcccc	cgcgacgcg	cccagccgtg	caccccgcg	gaccggggcc	cgcgaccgc	780
gtcggagtcg	accccgccg	ccaccgccc	gcgcgtgggt	agcatcagcc	acgggatgga	840
tctgatcggc	aggcatcacg	aacagtaagc	ggtgttccgg	ttgaatccaa	tgtgctgtca	900
gcaggcatcc	gatgccgaac	accgaccacg	cgagcagtcg	caatctgtct	cgcgaccctg	960
gcgtcacgcg	gcgtcgtggc	tccgcaaccc	gcccggcgat	tcgcgcgcgc	cgctgcggcc	1020
ggctctccat	ggccgggttc	ttcagtcgct	cgcccggtgg	ctgttctgcg	aacggggccc	1080
ccgccccgct	gtccgctcga	tacgggatct	atcacgcagg	taggcccgtc	agccgtactc	1140
ttcgccccag	aacagcgggt	ccgtcgccgc	gcagaccagc	ggctcctgcc	ccagatacac	1200
ccaggcgggt	gcccggcatgt	ccagatcgtg	gccagcgcgc	gcggcacggg	ggagatcgga	1260
tct						1263

<210> 88

<211> 1413

<212> DNA

<213> Mycobacterium vaccae

<400> 88

atctactcga	ccttcgccga	ccgggcgtag	ccgggtggcc	tgacgtactc	cggccatccg	60
ctggcgaccg	cctgcgcggg	cgcgacgata	aacgcgatgg	aagacgaagg	catggtggcc	120
aacgctgccc	gcacgcggca	gcaggtgctc	ggaccgggtc	tgcgcgatct	cgccgcccgg	180
caccgttcgg	tcggcgaaat	ccgcggcctc	ggcgctcttc	gggcgggata	tgatccagaa	240
cgggcccggc	tgcgggttga	ggctctcggt	gcccagtgcc	gtcgacgcga	cgctgctcgg	300
gctggtgatg	cggccgcggg	aggcgctctc	ggccacaaac	gtcagcaccg	tgcccggggc	360
gatggatcta	tcagttcggc	cctggtcgcc	agcccgcgca	gggcagccag	ttccgctccg	420
gcgtcgatcg	gggtgggtcc	gtccggccag	cacaccagca	tccaccgag	gtcagacaac	480
gggtccccga	cgggtgcacat	ctcccagtcg	atgaacgccg	cgagctcggg	gacgtcgcgg	540
cgagcagca	cgttggttcag	atggcagtcg	ccgtgcatga	tcccgggttc	ggcgctcgtc	600
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ggatctgatc	agctcgggga	gcccgggtgc	cagcaacgcc	agcgtgggaa	gcaccgagac	720
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ctgtcagcag	gcacccgatg	ccgaacaccg	accacgcgag	cagtcgcaat	ctgtctcgcg	960
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ggcccgcgcg	cccgtcgtcc	gtccgataac	ggatctatca	cgcaggtagg	ccgtccagcc	1140
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atacaccag	gcgggtggccg	gcaggtccag	atcgtggcca	gcgcgcgcgg	cacgggtggag	1260
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gccccgggtg	gcgagaagca	ggactacatc	gaccgagcct	tgcgcaacat	cgggcccgtat	1380
ctgccagctg	aggttcccgc	tctcgtcgga	tct			1413

<210> 89
 <211> 1623
 <212> DNA
 <213> Mycobacterium vaccae

<400> 89
 atctactcga ccttcgccga ccgggcgtag ccgggtggcc tgacgtactc cggccatccg 60
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 aacgctgccc gcatcggcga gcaggtgctc ggaccgggtc tgcgcgatct cgccgcccgg 180
 caccgttcgg tcggcgaaagt ccgcggcctc ggcgctcttct gggcgggata tgatccagaa 240
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 gctggtgatg cggccgcggt aggcgtcctc ggtccacaac gtcagcaccg tgcccgggcg 360
 gatggatcta tcagttcggc cctggtcgcc agcccggcga gggcagccag ttccgctccg 420
 gcgtcgatcg ggttgggtcc gtccggccag cacaccagca tccacccgag gtcgagcaac 480
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 cgcagcagca cgttggttcag atggcagtcg ccgtgcatga tcccgggttc ggcgctcgtc 600
 ggcctgcgcg agtcagacca gtcggcgagc acatgcaccg acgggaacga ctccggcgcg 660
 ggatctgatc agtcggggga gccgggtgcc cagcaacgcc agcgtgggaa gcaccgagac 720
 cggcgcgatg tgcccgcgca gcagcgccca gccgtgcacc ccgcgggacc gggcccccg 780
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 ctgtcagcag gcatccgatg ccgaacaccg accacgcgag cagtcgcaat ctgtctcgcg 960
 accctggcgt cagcggcggt cgtgggtccg caaccgcggg gcgatgtcgc gcgcgccgct 1020
 gcggccggct ctccatggcc ggttcgttca gtcgctcgtc cgggtggctgt tctgcgaacg 1080
 ggcccgcgcg cccgtcgtcc gtccgatacg ggatctatca cgcaggtagg ccgtccagcc 1140
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 atacacccag gcggtggccg gcatgtccag atcgtggcca gcgcgcgcgg cacggtggag 1260
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 accgcgtgga tcgttcgtca gtacccgaag ctcttgagag ctaaggccaa ttgggaagat 1500
 acttgacact tcccatcaat agaggaaaag catcgcccta ggggatccgt agcgggcccg 1560
 gtgtttcgag tgaacttggg cagggcaatc ccatcgcgcg cagcccgcgc agcggaaatc 1620
 cac 1623

<210> 90
 <211> 75
 <212> PRT
 <213> Mycobacterium vaccae

<400> 90
 Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1 5 10 15
 Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
 20 25 30
 Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
 35 40 45
 Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
 50 55 60
 Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala
 65 70 75

<210> 91
 <211> 121
 <212> PRT
 <213> Mycobacterium vaccae

<400> 91

```
Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1          5          10          15
Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
 20          25          30
Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
 35          40          45
Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
 50          55          60
Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Asp Pro Glu
 65          70          75          80
Arg Ala Gly Leu Arg Val Glu Val Leu Gly Ala Gln Cys Arg Arg Arg
 85          90          95
Asp Val Val Gly Ala Gly Asp Ala Ala Ala Val Gly Val Leu Gly Pro
 100          105          110
Gln Arg Gln His Arg Ala Arg Ala Asp
 115          120
```

<210> 92

<211> 220

<212> PRT

<213> Mycobacterium vaccae

<400> 92

```
Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1          5          10          15
Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
 20          25          30
Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
 35          40          45
Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
 50          55          60
Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Asp Pro Glu
 65          70          75          80
Arg Ala Gly Leu Arg Val Glu Val Leu Gly Ala Gln Cys Arg Arg Arg
 85          90          95
Asp Val Val Gly Ala Gly Asp Ala Ala Ala Val Gly Val Leu Gly Pro
 100          105          110
Gln Arg Gln His Arg Ala Arg Ala Asp Gly Ser Ile Ser Ser Ala Leu
 115          120          125
Val Ala Ser Pro Pro Arg Ala Ala Ser Ser Ala Pro Ala Ser Ile Gly
 130          135          140
Leu Gly Pro Ser Gly Gln His Thr Ser Ile His Pro Arg Ser Ser Asn
 145          150          155          160
Gly Ser Pro Thr Val His Ile Ser Gln Ser Met Asn Ala Ala Ser Ser
 165          170          175
Gly Thr Ser Arg Arg Ser Ser Thr Leu Phe Arg Trp Gln Ser Pro Cys
 180          185          190
Met Ile Pro Gly Ser Ala Ser Ser Gly Leu Arg Glu Ser Ser Gln Ser
 195          200          205
Ala Ser Thr Cys Thr Asp Gly Asn Asp Ser Gly Ala
 210          215          220
```

<210> 93

<211> 281

<212> PRT

<213> Mycobacterium vaccae

<400> 93

```

Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1          5          10          15
Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
      20          25          30
Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
      35          40          45
Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
      50          55          60
Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Asp Pro Glu
65          70          75          80
Arg Ala Gly Leu Arg Val Glu Val Leu Gly Ala Gln Cys Arg Arg Arg
      85          90          95
Asp Val Val Gly Ala Gly Asp Ala Ala Ala Val Gly Val Leu Gly Pro
      100          105          110
Gln Arg Gln His Arg Ala Arg Ala Asp Gly Ser Ile Ser Ser Ala Leu
      115          120          125
Val Ala Ser Pro Pro Arg Ala Ala Ser Ser Ala Pro Ala Ser Ile Gly
      130          135          140
Leu Gly Pro Ser Gly Gln His Thr Ser Ile His Pro Arg Ser Ser Asn
145          150          155          160
Gly Ser Pro Thr Val His Ile Ser Gln Ser Met Asn Ala Ala Ser Ser
      165          170          175
Gly Thr Ser Arg Arg Ser Ser Thr Leu Phe Arg Trp Gln Ser Pro Cys
      180          185          190
Met Ile Pro Gly Ser Ala Ser Ser Gly Leu Arg Glu Ser Ser Gln Ser
      195          200          205
Ala Ser Thr Cys Thr Asp Gly Asn Asp Ser Gly Ala Gly Ser Asp Gln
      210          215          220
Leu Gly Glu Pro Gly Ala Gln Gln Arg Gln Arg Gly Lys His Arg Asp
225          230          235          240
Arg Arg Asp Val Pro Ala Gln Gln Arg Pro Ala Val His Pro Ala Gly
      245          250          255
Pro Gly Pro Ala Asp Arg Val Gly Val Asp Pro Gly Arg His Arg Arg
      260          265          270
Ala Arg Gly Gln His Gln Pro Arg Asp
      275          280

```

<210> 94

<211> 372

<212> PRT

<213> Mycobacterium vaccae

<400> 94

```

Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1          5          10          15
Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
      20          25          30
Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
      35          40          45
Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
      50          55          60
Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Asp Pro Glu
65          70          75          80
Arg Ala Gly Leu Arg Val Glu Val Leu Gly Ala Gln Cys Arg Arg Arg
      85          90          95

```

Asp Val Val Gly Ala Gly Asp Ala Ala Ala Val Gly Val Leu Gly Pro
 100 105 110
 Gln Arg Gln His Arg Ala Arg Ala Asp Gly Ser Ile Ser Ser Ala Leu
 115 120 125
 Val Ala Ser Pro Pro Arg Ala Ala Ser Ser Ala Pro Ala Ser Ile Gly
 130 135 140
 Leu Gly Pro Ser Gly Gln His Thr Ser Ile His Pro Arg Ser Ser Asn
 145 150 155 160
 Gly Ser Pro Thr Val His Ile Ser Gln Ser Met Asn Ala Ala Ser Ser
 165 170 175
 Gly Thr Ser Arg Arg Ser Ser Thr Leu Phe Arg Trp Gln Ser Pro Cys
 180 185 190
 Met Ile Pro Gly Ser Ala Ser Ser Gly Leu Arg Glu Ser Ser Gln Ser
 195 200 205
 Ala Ser Thr Cys Thr Asp Gly Asn Asp Ser Gly Ala Gly Ser Asp Gln
 210 215 220
 Leu Gly Glu Pro Gly Ala Gln Gln Arg Gln Arg Gly Lys His Arg Asp
 225 230 235 240
 Arg Arg Asp Val Pro Ala Gln Gln Arg Pro Ala Val His Pro Ala Gly
 245 250 255
 Pro Gly Pro Ala Asp Arg Val Gly Val Asp Pro Gly Arg His Arg Arg
 260 265 270
 Ala Arg Gly Gln His Gln Pro Arg Asp Gly Ser Asp Arg Gln Ala Ser
 275 280 285
 Arg Thr Val Ser Gly Val Pro Val Glu Ser Asn Val Leu Ser Ala Gly
 290 295 300
 Ile Arg Cys Arg Thr Pro Thr Thr Arg Ala Val Ala Ile Cys Leu Ala
 305 310 315 320
 Thr Leu Ala Ser Arg Gly Val Val Ala Pro Gln Pro Ala Gly Asp Val
 325 330 335
 Ala Arg Ala Ala Ala Ala Gly Ser Pro Trp Pro Val Arg Ser Val Ala
 340 345 350
 Arg Pro Val Ala Val Leu Arg Thr Gly Pro Pro Pro Arg Arg Pro Ser
 355 360 365
 Asp Thr Gly Ser
 370

<210> 95

<211> 423

<212> PRT

<213> Mycobacterium vaccae

<400> 95

Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1 5 10 15
 Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
 20 25 30
 Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
 35 40 45
 Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
 50 55 60
 Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Asp Pro Glu
 65 70 75 80
 Arg Ala Gly Leu Arg Val Glu Val Leu Gly Ala Gln Cys Arg Arg Arg
 85 90 95
 Asp Val Val Gly Ala Gly Asp Ala Ala Ala Val Gly Val Leu Gly Pro
 100 105 110

Gln Arg Gln His Arg Ala Arg Ala Asp Gly Ser Ile Ser Ser Ala Leu
 115 120 125
 Val Ala Ser Pro Pro Arg Ala Ala Ser Ser Ala Pro Ala Ser Ile Gly
 130 135 140
 Leu Gly Pro Ser Gly Gln His Thr Ser Ile His Pro Arg Ser Ser Asn
 145 150 155 160
 Gly Ser Pro Thr Val His Ile Ser Gln Ser Met Asn Ala Ala Ser Ser
 165 170 175
 Gly Thr Ser Arg Arg Ser Ser Thr Leu Phe Arg Trp Gln Ser Pro Cys
 180 185 190
 Met Ile Pro Gly Ser Ala Ser Ser Gly Leu Arg Glu Ser Ser Gln Ser
 195 200 205
 Ala Ser Thr Cys Thr Asp Gly Asn Asp Ser Gly Ala Gly Ser Asp Gln
 210 215 220
 Leu Gly Glu Pro Gly Ala Gln Gln Arg Gln Arg Gly Lys His Arg Asp
 225 230 235 240
 Arg Arg Asp Val Pro Ala Gln Gln Arg Pro Ala Val His Pro Ala Gly
 245 250 255
 Pro Gly Pro Ala Asp Arg Val Gly Val Asp Pro Gly Arg His Arg Arg
 260 265 270
 Ala Arg Gly Gln His Gln Pro Arg Asp Gly Ser Asp Arg Gln Ala Ser
 275 280 285
 Arg Thr Val Ser Gly Val Pro Val Glu Ser Asn Val Leu Ser Ala Gly
 290 295 300
 Ile Arg Cys Arg Thr Pro Thr Thr Arg Ala Val Ala Ile Cys Leu Ala
 305 310 315 320
 Thr Leu Ala Ser Arg Gly Val Val Ala Pro Gln Pro Ala Gly Asp Val
 325 330 335
 Ala Arg Ala Ala Ala Ala Gly Ser Pro Trp Pro Val Arg Ser Val Ala
 340 345 350
 Arg Pro Val Ala Val Leu Arg Thr Gly Pro Pro Pro Arg Arg Pro Ser
 355 360 365
 Asp Thr Gly Ser Ile Thr Gln Val Gly Arg Pro Ala Val Leu Phe Ala
 370 375 380
 Pro Glu Gln Arg Cys Arg Arg Arg Ala Asp Gln Arg Ser Cys Arg Gln
 385 390 395 400
 Ile His Pro Gly Gly Arg His Val Gln Ile Val Ala Ser Ala Arg
 405 410 415
 Gly Thr Val Glu Ile Gly Ser
 420

<210> 96

<211> 471

<212> PRT

<213> Mycobacterium vaccae

<400> 96

Ile Tyr Ser Thr Phe Ala Asp Arg Ala Tyr Pro Gly Gly Leu Thr Tyr
 1 5 10 15
 Ser Gly His Pro Leu Ala Thr Ala Cys Ala Val Ala Thr Ile Asn Ala
 20 25 30
 Met Glu Asp Glu Gly Met Val Ala Asn Ala Ala Arg Ile Gly Glu Gln
 35 40 45
 Val Leu Gly Pro Gly Leu Arg Asp Leu Ala Ala Arg His Arg Ser Val
 50 55 60
 Gly Glu Val Arg Gly Leu Gly Val Phe Trp Ala Gly Ser Asp Pro Glu
 65 70 75 80

Arg	Ala	Gly	Leu	Arg	Val	Glu	Val	Leu	Gly	Ala	Gln	Cys	Arg	Arg	Arg		
				85					90					95			
Asp	Val	Val	Gly	Ala	Gly	Asp	Ala	Ala	Ala	Val	Gly	Val	Leu	Gly	Pro		
			100					105					110				
Gln	Arg	Gln	His	Arg	Ala	Arg	Ala	Asp	Gly	Ser	Ile	Ser	Ser	Ala	Leu		
		115					120						125				
Val	Ala	Ser	Pro	Pro	Arg	Ala	Ala	Ser	Ser	Ala	Pro	Ala	Ser	Ile	Gly		
	130						135					140					
Leu	Gly	Pro	Ser	Gly	Gln	His	Thr	Ser	Ile	His	Pro	Arg	Ser	Ser	Asn		
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			180					185					190				
Met	Ile	Pro	Gly	Ser	Ala	Ser	Ser	Gly	Leu	Arg	Glu	Ser	Ser	Gln	Ser		
	195						200					205					
Ala	Ser	Thr	Cys	Thr	Asp	Gly	Asn	Asp	Ser	Gly	Ala	Gly	Ser	Asp	Gln		
	210					215					220						
Leu	Gly	Glu	Pro	Gly	Ala	Gln	Gln	Arg	Gln	Arg	Gly	Lys	His	Arg	Asp		
225					230					235					240		
Arg	Arg	Asp	Val	Pro	Ala	Gln	Gln	Arg	Pro	Ala	Val	His	Pro	Ala	Gly		
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		260						265					270				
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		275					280					285					
Arg	Thr	Val	Ser	Gly	Val	Pro	Val	Glu	Ser	Asn	Val	Leu	Ser	Ala	Gly		
	290					295					300						
Ile	Arg	Cys	Arg	Thr	Pro	Thr	Thr	Arg	Ala	Val	Ala	Ile	Cys	Leu	Ala		
305					310					315					320		
Thr	Leu	Ala	Ser	Arg	Gly	Val	Val	Ala	Pro	Gln	Pro	Ala	Gly	Asp	Val		
				325					330					335			
Ala	Arg	Ala	Ala	Ala	Ala	Gly	Ser	Pro	Trp	Pro	Val	Arg	Ser	Val	Ala		
			340					345					350				
Arg	Pro	Val	Ala	Val	Leu	Arg	Thr	Gly	Pro	Pro	Pro	Arg	Arg	Pro	Ser		
		355					360					365					
Asp	Thr	Gly	Ser	Ile	Thr	Gln	Val	Gly	Arg	Pro	Ala	Val	Leu	Phe	Ala		
	370					375				380							
Pro	Glu	Gln	Arg	Cys	Arg	Arg	Arg	Ala	Asp	Gln	Arg	Ser	Cys	Arg	Gln		
385					390					395					400		
Ile	His	Pro	Gly	Gly	Arg	His	Val	Gln	Ile	Val	Ala	Ser	Ala	Arg			
				405				410					415				
Gly	Thr	Val	Glu	Ile	Gly	Ser	Ile	Ala	Arg	Leu	Cys	Gly	Lys	Asp	Glu		
			420					425					430				
Ala	Val	Ala	Ala	Leu	His	Tyr	Val	Ala	Pro	Val	Gly	Glu	Lys	Gln	Asp		
		435					440					445					
Tyr	Ile	Asp	Arg	Ala	Leu	Arg	Asn	Ile	Gly	Pro	Tyr	Leu	Pro	Ala	Glu		
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Val	Pro	Ala	Leu	Val	Gly	Ser											
465					470												

<210> 97

<211> 541

<212> PRT

<213> Mycobacterium vaccae

<400> 97

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465	470	475
Thr Ala Trp Ile Val Arg Gln Tyr Pro Lys Leu Leu Arg Ala Lys Ala		480
	485	490
Asn Trp Glu Asp Thr Trp Thr Phe Pro Ser Ile Glu Glu Lys His Arg		495
	500	505
Pro Arg Gly Ser Val Ala Gly Pro Val Phe Arg Val Asn Leu Gly Arg		510
	515	520
Ala Ile Pro Ser Arg Ala Ala Arg Ala Ala Glu Ile His		525
530	535	540

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<210> 99
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<210> 100
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<210> 109
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<210> 111
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<400> 112
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<210> 113
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<400> 113
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<210> 114
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<400> 114
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<210> 115
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<220>
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 cccggcaccg ttcggtcggc gaagtccgcg gcctcggcgt cttctgggcg ggatctgatc 240
 cagaacggggc cggctcgcg gttgaggtcc tcggtgccca gtgccgtcga cgcgacgtcg 300
 tcggcgctgg tgatgcggcc gccgtaggcg tcctcgggtcc acaacgtcag caccgtgccc 360
 gggcgggatgg atctatcagt tcggccctgg tcgccagccc gccgagggca gccagttccg 420
 ctccggcgtc gatcgggttg ggtccgtccg gccagcacac cagcatccac ccgaggtcga 480
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 cgtcgggcct gcgcgagtc agccagtcgg cgagcacatg caccgacggg aacgactcgg 660
 gcgcgggatc tgatcagctc ggggagccgg gtgcccagca acgccagcgt ggggaagcacc 720
 gagaccggcg cgatgtgccc gcgcagcagc gccagccgt gcaccccgcg ggaccggggc 780
 ccgcggaccg cgtcggagtc gaccccgcc gccaccgcg cgcgcggtgg cagcatcagc 840
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 gccagataca cccaggcggg ggccggcatg tccagatcgt ggccagcgcg cgcggcacgg 1260
 tggagatccg atctatcgcg cggctgtgcg ggaaggacga ggccgtagcg gcgttgact 1320
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ccggcaccgc	gtggatcggt	cgtcagtacc	cgaagctctt	gagagctaag	gccaattggg	1500
aagatacttg	gaccttccca	tcaatagagg	aaaagcatcg	ccctagggga	tccgtagcgg	1560
gcccgggtgt	tgcagtgaac	ttgggcaggg	caatcccatc	gcgcgcagcc	cgcgtagcgg	1620
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Made in a lab

<400> 116

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			20					25					30		
Met	Glu	Asp	Glu	Gly	Met	Val	Ala	Asn	Ala	Ala	Arg	Ile	Gly	Glu	Gln
		35					40					45			
Val	Leu	Gly	Pro	Gly	Leu	Arg	Asp	Leu	Ala	Ala	Arg	His	Arg	Ser	Val
	50					55					60				
Gly	Glu	Val	Arg	Gly	Leu	Gly	Val	Phe	Trp	Ala	Gly	Ser	Asp	Pro	Glu
65					70				75						80
Arg	Ala	Gly	Leu	Arg	Val	Glu	Val	Leu	Gly	Ala	Gln	Cys	Arg	Arg	Arg
				85				90					95		
Asp	Val	Val	Gly	Ala	Gly	Asp	Ala	Ala	Ala	Val	Gly	Val	Leu	Gly	Pro
			100					105					110		
Gln	Arg	Gln	His	Arg	Ala	Arg	Ala	Asp	Gly	Ser	Ile	Ser	Ser	Ala	Leu
		115					120					125			
Val	Ala	Ser	Pro	Pro	Arg	Ala	Ala	Ser	Ser	Ala	Pro	Ala	Ser	Ile	Gly
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Leu	Gly	Pro	Ser	Gly	Gln	His	Thr	Ser	Ile	His	Pro	Arg	Ser	Ser	Asn
145					150					155					160
Gly	Ser	Pro	Thr	Val	His	Ile	Ser	Gln	Ser	Met	Asn	Ala	Ala	Ser	Ser
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Gly	Thr	Ser	Arg	Arg	Ser	Ser	Thr	Leu	Phe	Arg	Trp	Gln	Ser	Pro	Cys
			180					185					190		
Met	Ile	Pro	Gly	Ser	Ala	Ser	Ser	Gly	Leu	Arg	Glu	Ser	Ser	Gln	Ser
		195					200					205			
Ala	Ser	Thr	Cys	Thr	Asp	Gly	Asn	Asp	Ser	Gly	Ala	Gly	Ser	Asp	Gln
	210					215					220				
Leu	Gly	Glu	Pro	Gly	Ala	Gln	Gln	Arg	Gln	Arg	Gly	Lys	His	Arg	Asp
225					230					235					240
Arg	Arg	Asp	Val	Pro	Ala	Gln	Gln	Arg	Pro	Ala	Val	His	Pro	Ala	Gly
			245					250						255	
Pro	Gly	Pro	Ala	Asp	Arg	Val	Gly	Val	Asp	Pro	Gly	Arg	His	Arg	Arg
			260					265					270		
Ala	Arg	Gly	Gln	His	Gln	Pro	Arg	Asp	Gly	Ser	Asp	Arg	Gln	Ala	Ser
		275					280					285			
Arg	Thr	Val	Ser	Gly	Val	Pro	Val	Glu	Ser	Asn	Val	Leu	Ser	Ala	Gly
	290					295					300				
Ile	Arg	Cys	Arg	Thr	Pro	Thr	Thr	Arg	Ala	Val	Ala	Ile	Cys	Leu	Ala
305					310					315					320
Thr	Leu	Ala	Ser	Arg	Gly	Val	Val	Ala	Pro	Gln	Pro	Ala	Gly	Asp	Val
			325					330						335	

Ala	Arg	Ala	Ala	Ala	Ala	Gly	Ser	Pro	Trp	Pro	Val	Arg	Ser	Val	Ala	
Arg	Pro	Val	Ala	Val	Leu	Arg	Thr	Gly	Pro	Pro	Pro	Arg	Arg	Pro	Ser	
Asp	Thr	Gly	Ser	Ile	Thr	Gln	Val	Gly	Arg	Pro	Ala	Val	Leu	Phe	Ala	
Pro	Glu	Gln	Arg	Cys	Arg	Arg	Arg	Ala	Asp	Gln	Arg	Ser	Cys	Arg	Gln	
Ile	His	Pro	Gly	Gly	Arg	His	Val	Gln	Ile	Val	Ala	Ser	Ala	Arg		
Gly	Thr	Val	Glu	Ile	Gly	Ser	Ile	Ala	Arg	Leu	Cys	Gly	Lys	Asp	Glu	
Ala	Val	Ala	Ala	Leu	His	Tyr	Val	Ala	Pro	Val	Gly	Glu	Lys	Gln	Asp	
Tyr	Ile	Asp	Arg	Ala	Leu	Arg	Asn	Ile	Gly	Pro	Tyr	Leu	Pro	Ala	Glu	
Val	Pro	Ala	Leu	Val	Gly	Ser	Ile	Ala	Ala	Thr	Gly	Pro	Val	Pro	Gly	
Thr	Ala	Trp	Ile	Val	Arg	Gln	Tyr	Pro	Lys	Leu	Leu	Arg	Ala	Lys	Ala	
Asn	Trp	Glu	Asp	Thr	Trp	Thr	Phe	Pro	Ser	Ile	Glu	Glu	Lys	His	Arg	
Pro	Arg	Gly	Ser	Val	Ala	Gly	Pro	Val	Phe	Arg	Val	Asn	Leu	Gly	Arg	
Ala	Ile	Pro	Ser	Arg	Ala	Ala	Arg	Ala	Ala	Glu	Ile	His	Gly	Ser	His	
His	His	His	His	His												